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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPEAL BRIEF FOR THE APPELLANTS

Ex parte MASHITANI et al.

STEREOSCOPIC IMAGE DISPLAY WITHOUT GLASSES

Serial Number: 09/668,297
Filed: September 25, 2000
Appeal No.:
Group Art Unit: 2872
Examiner: Audrey Chang

Submitted herewith are three (3) copies of an Appeal Brief. A check in the amount of Three Hundred and Thirty Dollars ($330.00) is enclosed to cover the official fees for the Appeal Brief. Please charge any fee deficiencies required with respect to this paper, or overpayment to our Deposit Account No. 01-2300, **referencing docket number 107337-00008**.

Respectfully submitted,

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Date: July 27, 2004

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In re the Appellant:

MASHITANI et al.

Group Art Unit: 2872

Serial Number: 09/668,297

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Attorney Docket No.: 107336-00008

For: STEREOSCOPIC IMAGE DISPLAY WITHOUT GLASSES

BRIEF ON APPEAL

Date: July 27, 2004

I. INTRODUCTION

This is an appeal from the action of the Examiner dated October 27, 2003, finally rejecting claims 1-6 and 8-13, all claims pending in this application. Claims 1, 8 and 13 were objected to under 35 U.S.C. § 132; claims 1-6 and 10-13 were rejected to under 35 U.S.C. § 112, first paragraph; claims 1-6 and 8-13 were rejected to under 35 U.S.C. § 102(e); claims 1, 3, 5, 6, 8, 9, and 11-13 were rejected to under 35 U.S.C. § 103(a); and claims 2, 4, and 10 were also rejected under 35 U.S.C. § 103(a). A Notice of Appeal was timely filed on April 27, 2004 with a Petition for Extension of Time. This brief is being timely filed with a Petition for Extension of Time.

II. REAL PARTY IN INTEREST

The real party in interest in present application on appeal is Sanyo Electric Co., LTD.

III. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to the appellant, appellant's, applicant's representative, or assignee that will directly effect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

IV. STATUS OF CLAIMS

Claims 1-6 and 8-13, all of the claims pending in the present in the present application, are being appealed.

V. STATUS OF AMENDMENTS

Appellants believe that all amendments have been entered.

VI. SUMMARY OF THE INVENTION

The present invention relates to a stereoscopic image display device capable of tracking a head position of a viewer and insuring perception of a stereoscopic image by the viewer without using special glasses. The present invention enables perception of a stereoscopic image when the viewer moves both in a sideways direction as well as closer to and away from the display device. A detailed discussion of the invention recited in the present claims is provided in the Specification, beginning at page 14, line 19 and is illustrated in Figures 9-25.

Figure 9 illustrates a viewer A watching a stereoscopic display device 1. Sensors 101 are mounted on the stereoscopic display device 1 and detect the head position of the viewer A. The stereoscopic display device 1 includes a display 1a.

The stereoscopic display device 1 illustrated in figure 12, is formed from an image display which may be a liquid crystal panel 20. The image signal supplied to the liquid crystal display panel 20 results in a right eye image R and a left eye image L being alternately displayed every other vertical line. See Specification page 16, line 14 – page 17, line 2.

Figure 12 illustrates that the stereoscopic display device 1 also includes a shading barrier 10. Figures 12 and 13 illustrate that the shading barrier 10 may be formed from a plurality of continuous shading parts 10b that may be formed with black pigment. Liquid crystal shutters 10a and 10c are provided on both sides of the continuous shading part 10b. The liquid crystal shutters 10a and 10c are formed with transparent electrodes. The liquid crystal shutters (transparent electrodes) 10a and 10c are turned off and on in order to insure stereoscopic viewing without glasses. Specification, page 17, line 6 – page 19, line 24.

Figure 14 illustrates a block diagram of the stereoscopic display device 1. Sensor 101 detects position of the viewer A (shown in Figure 9). The output from this sensor is fed to a position sensing and controlling circuit 102, which detects a head position of the viewer A on the basis of the output from the sensor 101. The position sensing and controlling circuit 102 sends a control signal corresponding to the position of the viewer A to a display signal generation circuit 100 and a shading barrier dividing circuit 115. The display signal generating circuit 100 generates an image signal for a left eye and an image signal for a right eye and supplies the image signal to the liquid crystal display panel 20. The display signal generating circuit 100 also determines the number of display divisions on the basis of the control signal and independently controls

the switching between the image signal for the left eye and the right eye in each divided area. Specification, page 20, line 1 - page 21, line 2.

The shading barrier dividing control circuit 115 controls whether the liquid crystal shutters 10a and 10c of the shading barrier 10 are turned on or turned off. The shading barrier dividing control circuit also controls the positions of the shading part and a light transmitting part of the shading barrier 10. Specification, page 23, lines 5-20.

The shading barrier dividing control circuit 115 also controls the division of shading barrier 10 into areas in the horizontal direction. The shading barrier dividing control circuit 115 further controls the execution or non-execution of barrier shifting in each of the areas. Specification, page 27, lines 5-12.

The position sensing and controlling circuit 102 outputs four different control signals to the timing generation circuit 112 and the shading barrier dividing control circuit 115. These control signals represent the position of the viewer A. The first control signal is transmitted when the head position of the viewer A is in a normal view area. A second control signal is output when the head position of the viewer A is in a reverse view area of the liquid crystal display panel 20 (the viewer watches a left eye image with the right eye and watches a right eye image with the left eye). A third control signal is output when the head position of the viewer A is in an area shifted by approximately ¼ E to ¾ E (a moire area). Specification, page 23, line 21 - page 24, line 10.

The fourth control signal is output when the head position of the viewer A is out of the optimum position in a direction closer to or further from the stereoscopic viewing device 1. This fourth control signal indicates whether the viewer A has shifted closer to

or further from the optimum viewing position from display 1 and the shifting amount (i.e. the distance from the optimum position). Based on the fourth control signal, the shading barrier division control circuit 115 selects the number of areas H in which to divide the shading barrier 10 and whether or not the shading parts of each of the areas shifts by one quarter pitch. The fourth control signal in combination with the timing generation circuit 112 controls whether or not the order of display of a right eye image and a left eye image in each of the areas H switches. Specification, page 24, lines 11-25.

Figures 15-20, 25 and 27 illustrate dividing the display 1a into two areas H1 and H2. Figures 10, 11, and 21-24 illustrate dividing the display 1a into three areas H1, H2, and H3. Figure 26 illustrates dividing the display 1a into four areas H1, H2, H3, and H4.

The shading barrier control circuit 115 after receiving the fourth control signal, divides the shading barrier 10 into areas in the horizontal direction and execution or non-execution of barrier shifting is set independently in each of the areas. Additionally, the timing generation circuit divides the liquid crystal display panel 20 into areas corresponding to the areas of the shading barrier 10. The timing generation circuit 112 also determines whether or not the left and right images are replaced in each of the areas. Specification page 27, lines 5-20.

The specification beginning at page 27, line 22 describes in detail dividing the liquid crystal display panel into two areas. Similarly, the specification at page 36 beginning at line 16 discloses the details of dividing the liquid crystal display panel into three areas. The specification beginning at page 43, line 18 provides the details of dividing a liquid crystal display panel into four areas.

The shading barrier 10 may be turned on so that one aperture corresponds to two pixels displayed on the liquid crystal display panel 20. Specification page 17, lines 20-22. The pitch is formed so that the continuous shading part 10b and one of the transparent electrodes 10a or 10c correspond to two pixels of the liquid crystal panel 20. Specification, page 10, lines 11-14.

A width of the transparent electrodes 10a and 10c is formed so that a part not superimposed with the continuous shading part 10b is Q divided by 4. Therefore, the shading part may be shifted by Q divided by 4 by switching on and off of the transparent electrodes 10a and 10c. The liquid crystal shutter is formed from transparent electrodes 10a and 10c.

As illustrated in Figure 34 the transparent electrodes 45a (10a) and 45c (10c) may be formed so as to belong to adjacent separate groups (i.e., group 1 – $45a_1$ and $45c_1$ and Group 2 – $45a_2$ and $45c_2$) so that the width of the aperture on the boundary part of each of the areas does not change when shifting the shading part 150. Specification, page 50, lines 15-20.

Similarly in figures 35 and 36 the left and right sided apertures are separately controlled leaving the shading part 150b as the boundary. And the widths of the apertures 151 and 152 are controlled such that the aperture widths do not change. In order to control the transparent electrodes such that the aperture widths do not change before or after shifting of the shading part 150, the transparent electrodes may be formed so as to belong to separate adjacent groups when forming the transparent electrodes. Specification, page 50, line 15 – page 51, line 4. A detailed description of this feature is disclosed beginning at line 6 on page 51.

A partial two-dimensional image display is possible when using a shading barrier formed from all liquid crystal shutters. In this embodiment, the continuous shading part is formed from a liquid crystal shutter instead of a black pigment. Thus, either the entire shading barrier or one of areas (for example, H1 or H2) is controlled such that the area allows total transmission of the light from the display panel 20. Consequently, a partial two-dimensional image may be displayed or the two-dimensional image may be displayed on the entire area. Specification, page 54, line 16-24.

VII. THE FINAL REJECTION

Claims 1-6 and 8-13 are pending in this application. No claim stands allowed. In the October 27, 2003 Office Action, Claims 1-6 and 8-13 were finally rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement. Claim 13 was finally rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. Claims 1-6 and 8-13 were finally rejected under 35 U.S.C. § 102(e) as being anticipated by Hamagishi et al.. (U.S. Patent No. 6,049,424). Claims 1, 3, 5, 6, 8, 9 and 11-13 were finally rejected under 35 U.S.C. § 103(a) as being unpatentable over Isono et al. (U.S. Patent No. 5,315,377) in view of Chikazawa (U.S. Patent No. 5,900,972). Claims 2, 4 and 10 were finally rejected under 35 U.S.C. § 103(a) as being unpatentable over Isono et al. (U.S. Patent No. 5,315,377) and Chikazawa (U.S. Patent No. 5,900,972) in further view of Taniguchi (U.S. Patent 6,094,216).

VIII. ISSUES ON APPEAL

The first issue on appeal is whether Claims 1-6 and 8-13 comply with the written description requirement.

The second issue on appeal is whether Claim 13 complies with the enablement requirement.

The third issue on appeal is whether Claims 1-6 and 8-13 are patentable over Hamagishi et al. (U.S. 6,049,424).

The fourth issue on appeal is whether Claims 1, 3, 5, 6, 8, 9 and 11-13 are patentable over Isonio et al. (U.S. Patent No. 5,315,377) in view Chikazawa (U.S. Patent No. 5,900,972).

The fifth issue on appeal is whether Claims 2, 4, and 10 are patentable over Isonio et al. (U.S. Patent No. 5,315,377) and Chikazawa (U.S. Patent No. 5,900,972) in further view of Taniguchi et al (U.S. Patent No. 6,094,216).

IX. GROUPING OF CLAIMS

Each claim of this patent application is separately patentable, and upon issuance of a patent, will be entitled to a separate presumption of validity under 35 U.S.C. § 282. For a convenience in handling this appeal, Claims 1-6 and 10-12 stand or fall together; Claims 8 and 9 stand or fall together; and Claim 13 stands or falls alone.

X. APPELLANT'S ARGUMENTS

Claims 1-6 and 10-13 comply with the written description requirement

In the Office Action dated October 27, 2003, claims 1-6 and 10-13 were rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement.

Specifically, the Office Action asserts that the features of "each area including a plurality of continuous shading parts" that was added to claim 1, the "width of the aperture maintained at a uniform width" that was added to claim 8, and "the optional area replacing the continuous shading part with a liquid crystal shutter" that was added to claim 13, were not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

35 U.S.C. §112, first paragraph recites in part:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

An objective standard for determining compliance with the written description requirement is, "does the description clearly allow persons of ordinary skill in the art to recognize that he or she invented what is claimed." *In re Gosteli*, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989). To satisfy the written description requirement, an applicant must convey with reasonable clarity to those skilled in the art that he or she was in possession of the invention, and that the invention, in that context, is whatever is now claimed. *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991).

The test for sufficiency of support in an application is whether the disclosure of the application "reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter." *Ralston Purina Co. v. Far-Mar-Co., Inc.*, 772 F.2d 1570, 1575, 227 USPQ 177, 179 (Fed. Cir. 1985) (quoting In re Kaslow, 707

F.2d 1366, 1375, 217 USPQ 1089, 1096 (Fed. Cir. 1983)). An applicant shows possession of the claimed invention by describing the claimed invention with all of its limitations using such descriptive means as words, structures, figures, diagrams, and formulas that fully set forth the claimed invention. *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997).

Claim 1 recites in part:

> each area including a plurality of continuous shading parts.

Regarding this element of claim 1, the Specification at page 14, lines 9-25 states:

> A stereoscopic image display device without glasses according to the embodiment is structured so that a shading part of shading means for generating binocular parallax effect shifts by 1/4 of a pitch of the shading part as shown in JP9-197344 A. **With this structure, the shading means is divided into areas in a horizontal direction** and the number of divided areas and whether or not the shading parts are shifted by 1/4 of its pitch in each of the areas are determined, and displaying of an image on a display area corresponding to the above area is controlled.
>
> Fig. 9 illustrates the viewer 2 watching a stereoscopic display device 1 without glasses. Sensors 101 for detecting a head position of the viewer 2 are mounted on upper ends of the stereoscopic display device 1 without glasses. **Figs. 10, 11 illustrate a display 1a with shading means divided into three areas of H1, H2, and H3** when the sensors 101 detect the head of the viewer 2 shifts.

(emphasis added)

When describing Fig. 14, the Specification at page 20, lines 7-13 states:

> Output from the sensor 101 for detecting a position of the viewer 2 is fed to a position sensing and controlling circuit 102, the position sensing and controlling circuit 102 detects a head position of the viewer 2 on the basis of the output from the sensor 101, and feeds a control signal corresponding to the position to a display signal generation circuit 100 and a shading barrier dividing control circuit 115.

The Specification also states at page 27, lines 9-12:

> When the fourth control signal is outputted, **the shading barrier 10 is divided into areas in the horizontal direction**.

(emphasis added)

The Specification further stares at page 48, line 19 to page 49, line 9:

> Fig. 33 is a structure of the transparent electrodes divided into groups. The transparent electrodes 45a1, 45a2, 45b1, and 45b2 are categorized into different groups each of the groups are collected with lateral electrodes in upper and lower areas. These electrodes are separately controlled by every group.
>
> An alternating voltage of 0V or a square wave is applied to the transparent electrode 45a1, 45a2, 45b1, and 45b2 of the panel, and a voltage of 0V is applied to the transparent electrode 44 constantly. Then liquid crystals on an upper part of the transparent electrodes applied with the alternating voltage are aligned and a polarization axis is not rotated. **Therefore, light incident to this part does not pass through the polarizing plate 421 and this part serves as the shading part together with the continuous shading part 46.**

(emphasis added)

Fig. 34 illustrates a similar structure. In both Figs. 33 and 34 the continuous shading part is identified with reference numeral 45b (10b) or 45b2 (10b) respectively. In each of Figs. 33 and 34 there are a plurality of continuous shading parts in each area (group). Consequently, the Specification and Drawings clearly convey to one skilled in the relevant art that each area includes a plurality of continuous shading parts. Therefore, the Specification and Drawings clearly convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the invention recited in claim 1.

In further support of the Specification's disclosure of "each area including a plurality of continuous shading parts", the Specification at page 16, beginning at line 9 states:

> The stereoscopic display device 1, as shown in Fig. 12, comprises a liquid crystal panel 20, a shading barrier 10 arranged on a viewer side of the liquid crystal panel 20, and a flat light source 30.

Further, the example in Figure 12 illustrates eight continuous shading parts 10b. One of ordinary skill in the art would understand that an actual display could contain more than eight continuous shading parts 10b, because the specification at page 17, beginning at line 17 states:

> For example, in order to realize the function, the transparent electrode for turning the barrier on and off is subdivided to make the shifting of the shading part possible. The barrier is turned on so that one aperture corresponds to two pixels displayed on the liquid crystal display panel 20.

A person of ordinary skill would also recognize that if the display 1 shown in Fig. 12 were divided into areas in the horizontal direction, for example, two areas as shown in Figs. 15-20, 25, and 27, three areas as shown in Figs. 10-11 and 21-24, or four areas as illustrated in Fig. 26, then there would be at least two continuous shading parts 10b (i.e. a plurality) for each area. Consequently, the Specification and Drawings clearly convey to one skilled in the relevant art that each area includes a plurality of continuous shading parts. Therefore, the Specification and Drawings clearly convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the invention recited in claim 1.

Claim 8 recites in part:

> wherein ... the aperture widths are maintained at a uniform width by setting a boundary edge of divided areas of the shading means at one of the continuous shading parts.

Regarding this portion of claim 8, the Specification at page 50, lines 6-19 provides:

> When the electrodes are divided into the groups, a width of the aperture 151 changes and luminescent lines or black lines may be observed. **The following embodiment divides the shading barrier into at least two areas and controls so that a width of the aperture on the boundary part of each of the areas of the shading barrier 10 (a parallax barrier)**

> **to be controlled separately does not change**. Such the control prevents generation of luminescent lines and black lines.
>
> As shown in Fig. 34, when forming the transparent electrodes, the transparent electrode for indicating before and after the shifting of the **shading part 150 may be formed so as to belong to adjacent separate groups so that a width of the aperture on the boundary part of each of the areas does not change**.
>
> Explanation is made on this embodiment by referring to Figs. 35, 36. In Figs. 35, 36, left and right side apertures are separately controlled, **leaving the shading part 150B as a boundary. Therefore, widths of the apertures 151, 152 do not change**.

Fig. 34 also shows a continuous shading part 45b2 (10b) forming the boundary between group 1 (transparent electrodes 45a1 and 45c1 together with their associated continuous shading part) and group 2 (transparent electrodes 45a2 and 45c2 together with their associated continuous shading part).

Consequently, the specification and Figs. 34-36 clearly disclose that "the aperture widths are maintained at a uniform width by setting a boundary edge of divided areas of the shading means at one of the continuous shading parts." Thus, the Specification and Drawings clearly convey to one skilled in the relevant art maintaining the aperture widths at a uniform width. Therefore, the Specification and Drawings clearly convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the invention recited in claim 8.

Claim 13 recites in part:

> wherein the shading means further comprises an optional area, wherein the continuous shading part in the optional area is formed with a liquid crystal shutter so as to display a two-dimensional image on a display area corresponding to the optional area.

Regarding this portion of amended claim 13, the Specification at page 17, beginning at line 11 states:

> The shading barrier 10 composed of the TN-type liquid crystal display panel is so constructed that a transparent electrode of ITO or the like is patterned on the inner surfaces of the glass substrates 11 and 12, and the shading part of the barrier can be electrically turned on and off. Further, the shading barrier 10 has a function of shifting the shading part by 1/4 of its pitch. For example, in order to realize the function, the transparent electrode for turning the barrier on and off is subdivided to make the shifting of the shading part possible.
>
> Furthermore, the Specification at page 54, lines 16-24 recites:
>
> The above explanation is only about stereoscopic viewing (supplying a stereoscopic image), a partial two-dimensional image display is possible by opening the barrier for either of the divided areas (total transmission; in this case all the shading part is structured by liquid crystal shutters) and displaying a normal two-dimensional image on an area of the liquid crystal display panel corresponding to the area. Needless to say, it is possible to display a two-dimensional image on the whole area.

As illustrated above, the specification clearly discloses that the continuous shading part may be formed with a liquid crystal shutter. Consequently, the Specification and Drawings clearly convey to one skilled in the relevant art that the continuous shading part in the optional area may be formed with a liquid crystal shutter so as to display a two-dimensional image on a display area corresponding to the optional area. Therefore, the Specification and Drawings clearly convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the invention recited in claim 13.

Claim 13 complies with the enablement requirement

Claim 13 was rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, the Office Action asserted that the

specification fails to teach how could the shading part be replaced with a liquid crystal shutter.

35 U.S.C. §112, first paragraph recites in part:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to **enable** any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

(emphasis added)

In the response filed April 21, 2004, Applicants amended claim 13. Claim 13, as amended, recites in part:

> wherein the shading means further comprises an optional area, wherein the continuous shading part in the optional area is formed with a liquid crystal shutter so as to display a two-dimensional image on a display area corresponding to the optional area.

Regarding this portion of amended claim 13, the Specification at page 17, beginning at line 11 states:

> The shading barrier 10 composed of the TN-type liquid crystal display panel is so constructed that a transparent electrode of ITO or the like is patterned on the inner surfaces of the glass substrates 11 and 12, and the shading part of the barrier can be electrically turned on and off. Further, the shading barrier 10 has a function of shifting the shading part by 1/4 of its pitch. For example, in order to realize the function, the transparent electrode for turning the barrier on and off is subdivided to make the shifting of the shading part possible.

Furthermore, the Specification at page 54, lines 16-24 recites:

> The above explanation is only about stereoscopic viewing (supplying a stereoscopic image), a partial two-dimensional image display is possible by opening the barrier for either of the divided areas (total transmission; in this case all the shading part is structured by liquid crystal shutters) and displaying a normal two-dimensional image on an area of the liquid crystal display panel corresponding to the area. Needless to say, it is possible to display a two-dimensional image on the whole area.

As illustrated above, the specification clearly discloses that the continuous shading part may be formed with a liquid crystal shutter. Consequently, the Specification and Drawings clearly enable one skilled in the relevant art to make and use the claimed invention including a continuous shading part in the optional area formed with a liquid crystal shutter so as to display a two-dimensional image on a display area corresponding to the optional area. Therefore, the Specification and Drawings clearly enable the invention recited in claim 13.

Claims 1-6 and 8-13 are patentable over Hamagishi et al. (U.S. 6,049,424)

Claims 1-6 and 8-13 were rejected under 35 U.S.C. § 102(e) as being anticipated by Hamagishi (U.S. Patent No. 6,049,424).

35 U.S.C. § 102(e) recites:

A person shall be entitled to a patent unless -

> (e) the invention was described in - (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for the purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language;

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "When a claim covers several structures or compositions, either

generically or as alternatives, the claim is deemed anticipated if any of the structures or compositions within the scope of the claim is known in the prior art." *Brown v. 3M*, 265 F.3d 1349, 1351, 60 USPQ2d 1375, 1376 (Fed. Cir. 2001) (claim to a system for setting a computer clock to an offset time to address the Year 2000 (Y2K) problem, applicable to records with year date data in "at least one of two-digit, three-digit, or four-digit" representations, was held anticipated by a system that offsets year dates in only two-digit formats). "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Claim 1 recites in part:

> area shifting and division control means for dividing the shading means into areas in a horizontal direction and controlling shifting of said liquid crystal shutters in each of the areas, each area including a plurality of continuous shading parts.

(emphasis added)

This element of claim 1, is a means-plus-function element under 35 U.S.C. § 112, paragraph 6. Paragraph 6 states that:

> An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

In order to anticipate a means-plus-function element the cited reference must perform the identical function specified in the claim in substantially the same way, and produce substantially the same results as the corresponding element disclosed in the specification. *Kemco Sales, Inc. v. Control Papers Co.*, 208 F.3d 1352, 54 USPQ2d 1308 (Fed. Cir. 2000) (An internal adhesive sealing the inner surfaces of an envelope

pocket was not held to be equivalent to an adhesive on a flap which attached to the outside of the pocket. Both the claimed invention and the accused device performed the same function of closing the envelope. But the accused device performed it in a substantially different way (by an internal adhesive on the inside of the pocket) with a substantially different result (the adhesive attached the inner surfaces of both sides of the pocket)); *Odetics Inc. v. Storage Tech. Corp.*, 185 F.3d 1259, 1267, 51 USPQ2d 1225, 1229-30 (Fed. Cir. 1999); *Lockheed Aircraft Corp. v. United States*, 193 USPQ 449, 461 (Ct. Cl. 1977).

Consequently, the analysis of a means-plus-function claim element is a three step process. First, Hamagishi must perform the exact function of "dividing the shading means into areas in a horizontal direction and controlling shifting of said liquid crystal shutters in each of the areas, each area including a plurality of continuous shading parts." Second, if Hamagishi performs this function, then the function must be performed in substantially the same way. Third, the function disclosed in Hamagishi must produce substantially the same result.

Hamagishi teaches a three dimensional display device. This reference clearly teaches at column 8, beginning at line 32:

> The 3D display device comprises a sensor (not shown) for sensing the position of the head of the viewer 2 and barrier movement means for laterally moving the shading barrier 10 from the initial position when the sensor senses that the head of the viewer 2 is in a position where normal 3D images cannot be viewed, that is; a moire position in a case where the shading barrier 10 is fixed.
>
> The barrier movement means may comprise a machine mechanism for mechanically moving the shading barrier 10. In the present invention, however, barrier movement means comprising liquid crystal shutters 31 and 32 arranged in both ends in the lateral direction of the slit 11 of the shading barrier 10 fixedly located, as shown in FIGS. 5 and 6, and a control circuit unit for selectively turning the liquid crystal shutters 31 and

32 on and off upon input of an output of the above-mentioned sensor which is not illustrated is used in order to make the delay of control as little as possible.

Accordingly, this portion of Hamagishi may teach the claim element:

> a shading means comprising a plurality of continuous shading parts and liquid crystal shutters provided on both sides of the continuous shading part, the liquid crystal shutters turning on and off based upon the position of the head of the viewer to generate a binocular parallax effect;

As illustrated in Figure 21 and elsewhere in Hamagishi, this reference teaches shifting the liquid crystal shutters across the entire display. Hamagishi, however, fails to disclose the function of dividing the shading barrier into areas in a horizontal direction and controlling shifting of said liquid crystal shutters in each of the areas, each area including a plurality of continuous shading parts. Similarly, the figures of Hamagish fail to show that the shading barrier is divided into areas. In contrast, Figures 15-20, 25, 27, 33 and 34 of the present specification illustrate dividing the shading means into two areas. Figures 10, 11, and 21-24 illustrate dividing the shading means into three areas.

Since Hamagishi fails to teach the function of dividing the shading means into areas in a horizontal direction and controlling shifting of the liquid crystal shutters in each of the areas, each area including a plurality of continuous shading parts, Hamagishi cannot anticipate this claim element.

In further support of Applicants' position, Applicants note that Hamagishi teaches that the viewer must remain at a predetermined distance from the display in order to view a 3D image. Specifically, Hamagishi at column 8, line 55 – column 9, line 23 states:

> Letting B be the amount of movement of the slit 11, d be the distance between the LCD panel 20 and the shading barrier 10, P be the pitch between pixels on the LCD panel 20, D be the spacing between the

LCD panel 20 and the eyes, and E be the distance between the eyes, the relationships indicated by the following equations (1) and (2) hold:

$$P:d=E:(D+d) \quad (1)$$

$$B:d=E/2:D \quad (2)$$

As shown in FIG. 8, the relationship indicated by the following equation (3) holds among the pitch Q of the shading barrier 10, the distance between the eyes E, the distance d between the LCD panel 20 and the shading barrier 10, and the spacing between the LCD panel 20 and the eyes:

$$2E:D=Q:d \quad (3)$$

The relationships indicated by the following equations (4) to (6) can be found from the equations (1) to (3):

$$D=(E-P)d/P \quad (4)$$

$$Q=(E-P)/2EP \quad (5)$$

$$B=Q/4 \quad (6)$$

From the foregoing equations (4) to (6), the distance between the LCD panel 20 and the eyes, that is, the proper viewing distance D is determined by the distance d between the shading barrier 10 and the LCD panel 20 and the pitch between pixels P. When the pitch between pixels P is constant, therefore, the proper viewing distance D is determined by the distance d between the shading barrier 10 and the LCD panel 20.

Consequently, Hamagishi teaches that the proper viewing distance D is fixed for a given display.

In contrast, the Specification at page 24, lines 12-20 teaches that:

> Further, the position sensing and controlling circuit 102 outputs a fourth control signal to the timing generation circuit 112 and the shading barrier division control circuit 115 when the head position of the viewer 2 is out of the optimum positions in back and forth directions by more than a predetermined distance. The fourth control signal differs depending on whether the head position of the viewer 2 is shifted in a back or forth direction from the optimum positions and a shifting amount (a distance from the optimum positions).

This fourth signal controls the division of barrier 10 as described in the Specification at page 27, lines 5-12 discloses that:

> Explanation is made on a case where the viewer 2 is out of the optimum viewing position in a back or forth direction and a fourth control signal is outputted to the timing generating circuit 112 and the shading barrier division control circuit 115. When the fourth control signal is outputted, the shading barrier 10 is divided into areas in a horizontal direction and execution or non-execution of barrier shifting is set in each of the areas. The shading barrier division control circuit 115 conducts control of the setting.

Consequently, the viewer's ability to move closer to and further from (back and forth from) the display is the result of the function - "dividing the shading means into areas in a horizontal direction and controlling shifting of the liquid crystal shutters in each of the areas, each area including a plurality of continuous shading parts".

As discussed above, Hamagishi teaches that the viewer must remain at a predetermined and fixed distance from the display. Consequently, this reference fails to obtain substantially the same result as the function - "dividing the shading means into areas in a horizontal direction and controlling shifting of the liquid crystal shutters in each of the areas, each area including a plurality of continuous shading parts".

Therefore, Hamagishi fails to teach and/or suggest the claimed invention. Specifically, this reference fails to teach the function of "dividing the shading means into areas in a horizontal direction and controlling shifting of the liquid crystal shutters in each of the areas, each area including a plurality of continuous shading parts." Consequently, Hamagishi fails to teach and/or suggest an area shifting and division control means for dividing the shading means into areas in a horizontal direction and controlling shifting of the liquid crystal shutters in each of the areas, each area including

a plurality of continuous shading parts. Therefore, claims 1-6 and 8-13 are patentable over Hanagishi.

Claims 1, 3, 5, 6, 8, 9 and 11-13 are patentable over Isonio et al. (U.S. Patent No. 5,315,377) in view Chikazawa (U.S. Patent No. 5,900,972)

Claims 1, 3, 5, 6, 8-9 and 11-13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Isono (U.S. Patent No. 5,315,377) in combination with Chikazawa (U.S. Patent No. 5,900,972).

Several basic factual inquiries must be made to determine obviousness or non-obviousness of patent application claims under 35 U.S.C. § 103. These factual inquiries are set forth in Graham v. John Deere Co., 383 U.S. 1, 17, 148 U.S.P.Q. 459, 467 (1996):

> Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; the level of ordinary skill in the pertinent art resolved. Against this backdrop, the obviousness or non-obviousness of the subject matter is determined.

The specific factual inquiries set forth in *Graham* have not been considered or properly applied by the Examiner formulating the rejections of the claims. Particularly the differences between the prior art and the claims were not properly determined. As stated by the Federal Circuit in In re Ochiai, 37 U.S.P.Q. 2d 1127, 1131 (Fed. Cir. 1995):

> [t]he test of obviousness *vel non* is statutory. It requires that one compare the claim's subject matter

> as a whole with a prior art to which the subject matter pertains. 35 U.S.C. § 103.
>
> The inquiry is highly fact-specific by design.... When the references cited by the Examiner fail to establish a *prima facie* case of obviousness, the rejection is improper and will be overturned. In re Fine, 837 F.2d 1071, 1074, 5 U.S.P.Q. 2d 1596, 1598 (Fed. Cir. 1988). (Emphasis added.)

When rejecting claims under 35 U.S.C. § 103, an Examiner bears an initial burden of presenting a prima facie case of obviousness. A prima facie case of obviousness is established only if the teachings of the prior art would have suggested the claimed subject matter to a person of ordinary skill in the art. If an Examiner fails to establish a prima facie case, the rejection is improper and will be overturned. See: In re Rijckaert, 9 F.3d 1531, 28 U.S.P.Q. 2d. 1955 (Fed. Cir. 1993). "If examination.... does not produce a prima facie case of unpatentability, then without more the applicant is entitled to the grant of the patent." In re Oetiker, 977 F.2d 1443, 1445 - 1446 24 U.S.P.Q. 2d. 1443, 1444 (Fed. Cir. 1992).

Appellants respectfully submit that the Examiner has not made a proper *prima facie* rejection under 35 U.S.C. § 103(a), because the combination of prior art references cited fails to teach or suggest the present invention.

Claim 1 recites in part:

> area shifting and division control means for dividing the shading means into areas in a horizontal direction and controlling shifting of said liquid crystal shutters in each of the areas, each area including a plurality of continuous shading parts.

This element of claim 1, is a means-plus-function element under 35 U.S.C. § 112, paragraph 6. Paragraph 6 states that:

> An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

In order to anticipate a means-plus-function element the cited reference(s) must perform the identical function specified in the claim in substantially the same way, and produce substantially the same results as the corresponding element disclosed in the specification. *Kemco Sales, Inc. v. Control Papers Co.*, 208 F.3d 1352, 54 USPQ2d 1308 (Fed. Cir. 2000) (An internal adhesive sealing the inner surfaces of an envelope pocket was not held to be equivalent to an adhesive on a flap which attached to the outside of the pocket. Both the claimed invention and the accused device performed the same function of closing the envelope. But the accused device performed it in a substantially different way (by an internal adhesive on the inside of the pocket) with a substantially different result (the adhesive attached the inner surfaces of both sides of the pocket)); *Odetics Inc. v. Storage Tech. Corp.*, 185 F.3d 1259, 1267, 51 USPQ2d 1225, 1229-30 (Fed. Cir. 1999); *Lockheed Aircraft Corp. v. United States*, 193 USPQ 449, 461 (Ct. Cl. 1977).

Consequently, the analysis of a means-plus-function claim element is a three step process. First, either Isono or Chikazawa must perform the exact function of "dividing the shading means into areas in a horizontal direction and controlling shifting of said liquid crystal shutters in each of the areas, each area including a plurality of continuous shading parts." Second, if either Isono or Chikazawa perform this function, then the function must be performed in substantially the same way. Third, the function disclosed in the reference must produce substantially the same result.

The Office Action asserted that the computer 20 and controller 22 of Isono perform the function of "dividing the shading means into areas in a horizontal direction and controlling shifting of said liquid crystal shutters in each of the areas, each area including a plurality of continuous shading parts." In making this assertion the Office Action makes reference to Figs. 1 and 2, and columns 4-7. Specifically, column 6, line 51 to column 7, line 24 provides:

> In accordance with the control data set in the registers 22-1 to 22-3, the controller 22 drives a driver 26 for a horizontal position control and a driver 24 for a vertical position control so that a parallax barrier is displayed on the liquid crystal display panel 28 synchronously with an input sync signal. When the 2D data is set in the register 22-1, since the controller 22 doesn't drive both of the drivers 24 and 26, no barrier is displayed on the panel 28. When the 3D data is set in the register 22-1, the controller 22 drives both of the drivers 24 and 26 in accordance with the view point count data set in the register 22-3 and controls the panel 28 so as to display a desired barrier in the window. When either the (2+3)D data or (2+3)D data is set in the register 22-1, the controller 22 drives both of the drivers 24 and 26 in accordance with the window data set in the register 22-2 and the view point count data set in the register 22-3, thereby controlling the panel 28 so as to display a barrier inside or outside of the window. When the parallax barrier is displayed, the stripe barrier can be also set into N gradations (N.gtoreq.3) instead of a binary gradation of black and white. Consequently, a loss of light amount which is caused due to a decrease in aperture ratio of the stripe barrier can be reduced. In the above case, it is necessary that the stripe barrier has a contrast enough to separate the image.
>
> When a rotation command from the input unit 6 or a phase shift command from the detecting unit 8 is supplied as a display control command, the computer 20 generates a barrier movement command to the controller 22. In response to the barrier movement command, the controller 22 drives the drivers 24 and 26 in such a manner that the parallax barrier displayed on the panel 28 is shifted to the right or left by a distance corresponding to one pixel in a real-time manner. When a distance change command is supplied as a display control command from the input unit 6, the computer 20 generates a magnification change command to the controller 58. In response to the magnification change command, the controller 58 drives a driver 57 so that the image can be stereoscopically observed from a position of the **designated** distance.

(emphasis added)

As discussed above and elsewhere in Isono, this reference teaches shifting the liquid crystal shutters across the entire display. Isono, however, fails to disclose the function of dividing the shading barrier into areas in a horizontal direction and controlling shifting of said liquid crystal shutters in each of the areas, each area including a plurality of continuous shading parts. Similarly, the figures of Isono and Fig. 2 in particular fail to show that the shading barrier is divided into areas. In contrast, Figures 15-20, 25, 27, 33 and 34 of the present specification illustrate dividing the shading means into two areas. And Figures 10, 11, and 21-24 illustrate dividing the shading means into three areas.

Isono, similar to Hamagishi, teaches that in response to the barrier movement command, the controller 22 drives the drivers 24 and 26 in such a manner that the parallax barrier displayed on the panel 28 is shifted to the right or left by a distance corresponding to one pixel in a real-time manner (column 7, lines 12-17; column 11, lines 49-54).

This reference, however, fails to teach and/or suggest dividing panel 28 into two or more areas and controlling the shifting of the liquid crystal shutters in each of separate areas of barrier 28.

Thus, Isono fails to teach and/or suggest the claimed invention. Specifically, Isono fails to teach the function of dividing the shading means into areas in a horizontal direction and controlling shifting of the liquid crystal shutters in each of the areas, each area including a plurality of continuous shading parts, Isono cannot anticipate this claim element. Therefore, this reference fails to teach and/or suggest an area shifting and

division control means for dividing the shading means into areas in a horizontal direction and controlling shifting of the liquid crystal shutters in each of the areas.

The Office Action admits that Isono does not teach explicitly that the parallax barrier may be comprised of liquid crystal shutters at two sides of a continuous shading part. The Office Action cites Chikazawa as teaching strips of liquid crystal shutters (39 and 40, Figure 13) to correct this deficiency in Isono. The Office Action also asserts that it would have been obvious to one of ordinary skill in the art to have a continuous shading part of the barrier. The Office Action asserts that such a modification would be obvious since one could make one part of the panel or one set of shutters to be always at a nontransparent or off state.

While Chikazawa may correct part of the deficiency noted by the Office Action in Isono, this reference is not cited for, nor does it teach, the function of dividing the shading means into areas in a horizontal direction and controlling shifting of the liquid crystal shutters in each of the areas.

Accordingly, the combination of Isono and Chikazawa fails to teach and/or suggest each element of the claimed invention. Specifically, the combination of these two references fails to teach the function of "dividing the shading means into areas in a horizontal direction and controlling shifting of the liquid crystal shutters in each of the areas." Consequently, these references fail to teach and/or suggest an area shifting and division control means for dividing the shading means into areas in a horizontal direction and controlling shifting of the liquid crystal shutters in each of the areas. Therefore, claims 1, 3, 5, 6, 8-9 and 11-13 are patentable over the combination of Isono and Chikazawa.

Claims 2, 4, and 10 are patentable over Isonio et al. (U.S. Patent No. 5,315,377) and Chikazawa (U.S. Patent No. 5,900,972) in further view of Taniguchi et al (U.S. Patent No. 6,094,216)

Claims 2, 4, and 10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Isono and Chikazawa (discussed above) and further in view of Taniguchi (U.S. Patent No. 6,094,216).

While Taniguchi may correct the deficiencies noted by the Examiner in the combination of Isono and Chikazawa, this reference is neither cited for, nor does it teach and/or suggest, an area shifting and division control means for dividing the shading means into areas in a horizontal direction and controlling shifting of the liquid crystal shutters in each of the areas.

Accordingly, the combination of these three references fails to teach each and every element of the claimed invention. Specifically, the combination of these three references fails to teach and/or suggest an area shifting and division control means for dividing the shading means into areas in a horizontal direction and controlling shifting of the liquid crystal shutters in each of the areas. Therefore, claims 2, 4 and 10 are patentable over the combination of Isono, Chikazawa, and Taniguchi

Conclusion

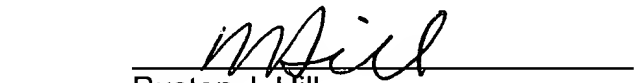
For all of the above noted reasons, it is strongly contended that Claims 1-6 and 10-13 comply with the written description requirement; that Claim 13 complies with the enablement requirement; that certain clear differences exist between the invention as

recited in Claims 1-6 and 8-13 and the prior art relied upon by the Examiner. It is further contended that these differences are more than sufficient that the present invention would not have been obvious to a person ordinary skill in the art at the time at the time the invention was made.

This final rejection being made in error, therefore, it is respectfully requested that this Honorable Board of Patent Appeals and Interferences reverse the Examiner's decision in this case and indicate the allowability of Claims 1-6 and 8-13.

In the event that this paper is not considered timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees which may be due with respect to this paper may be charged to our Deposit Account No. 01-2300, making reference to Attorney Docket No. 107336-00008.

Respectfully submitted,



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APPENDIX 1

CLAIMS ON APPEAL

1. (previously presented) An autostereoscopic image display device comprising:

an image display means for displaying a left eye image and a right eye image in alternately forming stripe-shaped patterns upon a liquid crystal display panel;

a sensor for sensing a position of a head of a viewer;

a shading means comprising a plurality of continuous shading parts and liquid crystal shutters provided on both sides of the continuous shading part, the liquid crystal shutters turning on and off based upon the position of the head of the viewer to generate a binocular parallax effect; and

area shifting and division control means for dividing the shading means into areas in a horizontal direction and controlling shifting of said liquid crystal shutters in each of the areas, each area including a plurality of continuous shading parts.

2. (previously presented) The autostereoscopic image display device according to claim 1, wherein the shading means is so structured that a position of the shading part shifts by ¼ pitch of a pitch of the shading part.

3. (previously presented) The autostereoscopic image display device according to claim 1, wherein a shading barrier dividing control circuit divides a display part of the image display means into areas to correspond to the divided areas of the

shading means and controls a display order of the left eye image and the right eye image in each of the divided areas depending on the position of the head of the viewer.

4. (previously presented) The autostereoscopic image display device according to claim 1, wherein the image display means comprises the liquid crystal display panel, the shading means is a shading barrier arranged between the liquid crystal display panel and a light source for emitting light in a flat shape arranged on a back side of the liquid crystal display panel.

5. (previously presented) The autostereoscopic image display device according to claim 1, wherein the shading means is a parallax barrier arranged on a light emission side of the image display means.

6. (previously presented) The autostereoscopic image display device according to claim 1, wherein the shading means comprises a liquid crystal panel.

Claim 7 (cancelled)

8. (previously presented) An autostereoscopic image display device comprising:

an image display means for displaying a left eye image and a right eye image in alternately forming stripe-shaped patterns upon a liquid crystal display panel;

a sensor for sensing a position of a head of a viewer;

a shading means comprising a continuous shading part and liquid crystal shutters provided on both sides of the continuous shading part, the liquid crystal shutters turning on and off based upon the position of the head of the viewer to generate a binocular parallax effect; and

area shifting and division control means for dividing the shading means into at least two areas in a horizontal direction and controlling shifting of said liquid crystal shutters in each of the areas, each area including at least one continuous shading part,

wherein apertures having aperture width are provided on the shading means for permitting a viewer to observe images formed by pixels displayed on the liquid crystal display panel,

the aperture widths are maintained at a uniform width by setting a boundary edge of divided areas of the shading means at one of the continuous shading parts.

9. (previously presented) The autostereoscopic image display device according to claim 8, wherein the liquid crystal shutter provided on both the first and the second sides of the continuous shading part sandwiching the aperture part which is equivalent to the boundary edge of each divided area is wired so as to be assigned in a same group of the liquid crystal shutter in an area adjacent to each divided area.

10. (previously presented) The autostereoscopic image display device according to claim 1, wherein the number of divided areas increases as the head position of the viewer moves further away from an optimum viewing position.

11. (previously presented) The autostereoscopic image display device according to claim 1, wherein the divided areas are divided uniformly.

12. (previously presented) The autostereoscopic image display device according to claim 1, wherein control of each of the divided areas is provided so as to supply an image for a dominant eye to the dominant eye of the viewer, when the viewer is outside the optimum viewing range for both eyes.

13. (previously presented) The autostereoscopic image display device according to claim 1, wherein the shading means further comprises an optional area, wherein the continuous shading part in the optional area is formed with a liquid crystal shutter so as to display a two-dimensional image on a display area corresponding to the optional area.